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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/003,258	12/06/2001	Nobuyuki Ohminami	829-593	4463

7590 12/20/2002

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EXAMINER

HAMDAN, WASSEEM H

ART UNIT	PAPER NUMBER
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2858

4

DATE MAILED: 12/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/003,258

Applicant(s)

OHMINAMI, NOBUYUKI

Examiner

Wasseem H Hamdan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-7 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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Part III - DETAILED ACTION

Specification

Drawings

1. Figures 8 and 9 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to because
- a. boxes 1, 2 and 10 of figure 1, require descriptive legends.
 - b. box 101 of figure 5, require descriptive legends.

Correction is required.

Claim Objections

3. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

5. Claims 1-3 and 7, are rejected under 35 U.S.C. 102(e) as being anticipated by Japanese Patent Laid-Open No. 06-112289 (inventor: Kono Motohiro et al.).

Regarding claim 1, Kono Motohiro et al. discloses an insulator capacitance analyzer for analyzing C-V characteristics [page 3 [0001]; page 16 (Drawing 5)] of a first MIS structure having unknown capacitance [page 15 (Drawing 2; page 4 [0013]), comprising:

a capacitance structure having known capacitance [Drawing 2 (VfbMAIS); page 4 [0010]] and configured so as to be serially connectable to the first MIS structure [Drawing 2 (VMAIS); page 4, lines 1-5]; and

a measuring section [page 16, Drawing 5 (box on the right hand side , since the drawings is not in English, it is verified on US Patent 5,233,291, Fig. 2 (a, 400)], for measuring synthesis capacitance [page 4, line 1] of the serially-connected first MIS structure and capacitance structure [page 15, Drawing 2 (VMAIS); page 4, lines 3-4] .

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Regarding claim 2, Kono Motohiro et al. discloses where in the capacitance structure includes at least one of a second MIS structure, a dielectric, and a capacitor [page 15, Drawing 2; page 4 [0013]].

Regarding claim 3, Kono Motohiro et al. discloses wherein the capacitance structure is configured so as to be removable from the insulator capacitance analyzer [page 16, Drawing 5].

Regarding claim 7, Kono Motohiro et al. discloses an insulator capacitance analysis method for analyzing C-V characteristics [page 3 [0001]; page 16 (Drawing 5)] of a first MIS structure having unknown capacitance [page 15 (Drawing 2; page 4 [0013]), comprising the steps of:

serially connecting the first MIS structure to a capacitance structure having known capacitance [Drawing 2 (VfbMAIS); page 4 [0010]; Drawing 2 (VMAIS); page 4, lines 1-5; [page 15, Drawing 2 (VMAIS); page 4, lines 3-4]; and

measuring synthesis capacitance of the serially-connected first MIS structure and capacitance structure [page 16, Drawing 5 (box on the right hand side , also verified on US Patent 5,233,291, Fig. 2 (a, 400)); page 4, line 1; page 15, Drawing 2 (VMAIS); page 4, lines 3-4].

calculating capacitance of the first MIS structure based on the synthesis capacitance [page 4 [0017]].

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Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 5 and 6, are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Laid-Open No. 06-112289 (inventor: Kono Motohiro et al.) in view of Japanese Patent Laid-Open No. 11-150246 (OKI Electric IND LTD).

Regarding claim 5, Kono Motohiro et al. discloses the essential elements of the claimed invention. However, Kono Motohiro et al. does not explicitly wherein the equivalent silicon oxide thickness of the capacitance of the capacitance structure is 3 nm or more. Japanese Patent Laid-Open No. 11-150246 discloses wherein the equivalent silicon oxide thickness of the capacitance of the capacitance structure is 3 nm or more [English abstract]. It would have been obvious to a person having ordinary skill in the art at the time of the invention was made to modify the teachings of Kono Motohiro et al. by including wherein the equivalent silicon oxide thickness of the capacitance of the capacitance structure is 3 nm or more. The skilled artisan would have been motivated to modify Kono Motohiro et al. as above for because the appropriate thickness of silicon oxide film prevents leakage current [Japanese Patent Laid-Open No. 11-150246: advantage].

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Regarding claim 6, Kono Motohiro et al. discloses the essential elements of the claimed invention. However, Kono Motohiro et al. does not explicitly wherein the capacitance structure is configured so as to prevent direct tunnel leakage current from flowing through the capacitance structure. Japanese Patent Laid-Open No. 11-150246 discloses wherein the capacitance structure is configured so as to prevent direct tunnel leakage current from flowing through the capacitance structure [Japanese Patent Laid-Open No. 11-150246: advantage]. It would have been obvious to a person having ordinary skill in the art at the time of the invention was made to modify the teachings of Kono Motohiro et al. by including wherein the capacitance structure is configured so as to prevent direct tunnel leakage current from flowing through the capacitance structure. The skilled artisan would have been motivated to modify Kono Motohiro et al. as above for because the appropriate thickness of silicon oxide film prevents leakage current [Japanese Patent Laid-Open No. 11-150246: advantage].

Allowable Subject Matter

Claim 4, is allowable because the prior art does not anticipate or suggest the combination of all the elements of the claimed apparatus for analyzing Capacitance-Voltage characteristics of a Metal/Insulator/Semiconductor structure.

Regarding claim 4, Kono Motohiro et al. discloses a plurality of capacitance structures each having known capacitance and configured so as to be serially connectable to the first MOS structure [page 15, Drawing 2], but the prior art of record does not teach:

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a switch for selecting one of the plurality of capacitance structures as the capacitance structure.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wasseem Hamdan whose telephone number is (703) 305-3968. The examiner can normally be reached Monday-Thursday from 700AM-400PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on (703) 308-0750.

The fax phone number for this Art Unit is (703)308-7722 or (703)308-7724.

Any inquiry of a general nature or relating to the status of this application should be directed to the Receptionist at (703) 305-3800.

9. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 308-7722 or (703) 308-7724, or (703) 305-3431, or (703) 305-3432 (for formal communications intended for entry, please label "FORMAL" and sign as attorney of record)

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Or:

(703) 305-9724 (for informal or draft communications, please label "PROPOSED" or "DRAFT" and prominently label PLEASE DELIVER DIRECTLY TO EXAMINER)

Hand-delivered responses should be brought to Crystal Plaza 4 [fourth Floor (Receptionist)], 2201 South Clark Place, Arlington, VA. 22202.

A handwritten signature in cursive script, appearing to read 'W. Hamdan'.

Wasseem H. Hamdan

December 10, 2002